

AUSTRALIAN ACANTHOCEPHALA No. 13: THREE NEW SPECIES

by S. J. EDMONDS*

Summary

Three new species of acanthocephalans are described from Australian hosts. A note on *Arhythmorhynchus johnstoni* Golvan, 1960 (= *A. frassoni* of Johnston and Edmonds, 1951) is also included. The new species are—(1) *Pseudoacanthocephalus perthensis* from *Litoria moorei* (Copeland) and *Limnodynastes dorsalis* (Gray), (2) *Neoechinorhynchus aldrichettae* from *Aldrichetta forsteri* (Cuvier and Valenciennes), and (3) *Arhythmorhynchus limosae* from *Limosa lapponica* (Linnaeus).

Pseudoacanthocephalus perthensis n. sp.

FIGS. 1-5

Pseudoacanthocephalus Petrotschenko, 1956; Golvan, 1969: 286.

Host and Locality. About 9 specimens were collected from frogs at Rockingham, near Perth, Western Australia by Dr. W. G. Inglis of the South Australian Museum, 6 from *Litoria moorei* (20/8/66) and 3 from *Limnodynastes dorsalis* (26/4/66). The specimens were found in the intestine of the frogs.

Type specimens (male and female); Australian Museum, Sydney.

Description. The parasites are small and stout, the female being longer and more cylindrical. The trunk of both sexes is curved ventrally to a slight extent.

The trunk of the male specimens is 2.6-3.2 mm long and has a maximum width of 0.6-0.8 mm. The corresponding measurements of the female are 5.1-6.9 mm and 0.8-1.1 mm. The trunk lacks spines and its body wall is thick. The introvert is subcylindrical to ovoidal in shape and arises anteriorly on the ventral side of the mid line of the trunk. Its length is 0.35-0.40 mm and width 0.21-0.30 mm. It is armed with 12-14 rows of 4-5 hooks per row. The length of the hooks measured directly from the highest point on the curve of the hook to the tip of the hook is about 70-90 μ m. All the hooks have well developed, posteriorly directed rooting processes. The sheath is double-walled and the cerebral ganglion lies at its base. The lemnisci are short and stout and about as long as the sheath.

The testes of the male lie either in tandem or so as to overlap slightly. There are three pairs of cement glands which in all but one specimen are pressed closely together. The

male aperture is terminal. The female complex of uterine bell, uterus and vagina is about 0.7-0.9 mm long and the female aperture appears to be subterminal. The eggs are ellipsoidal and do not possess polar prolongations of the middle shell. They are 45-55 μ m long and 20-25 μ m wide.

Systematic position. This species differs from *P. bufonis* (Shiple), *P. betsileo* Golvan, Houin and Brygoo (in Golvan, 1969: 291), *P. bigueti* (Houin, Golvan & Brygoo, 1965), *P. bufoncola* (Kostylew) and *P. caucasicus* (Petrotschenko) largely in the number of hooks found on the introvert.

This species lacks polar prolongations of the middle shell. I have not been able to ascertain whether the integument of the acanthor bears spines over its entire surface (Golvan, 1969: 287).

Golvan (1969: 287) says, "Quant à la validité du genre *Pseudoacanthocephalus*, bien que j'en ai d'abord douté (Golvan, 1960) elle me paraît aujourd'hui parfaitement acceptable, et ce n'est pas l'un des moindres mérites de Petrotschenko de l'avoir établie".

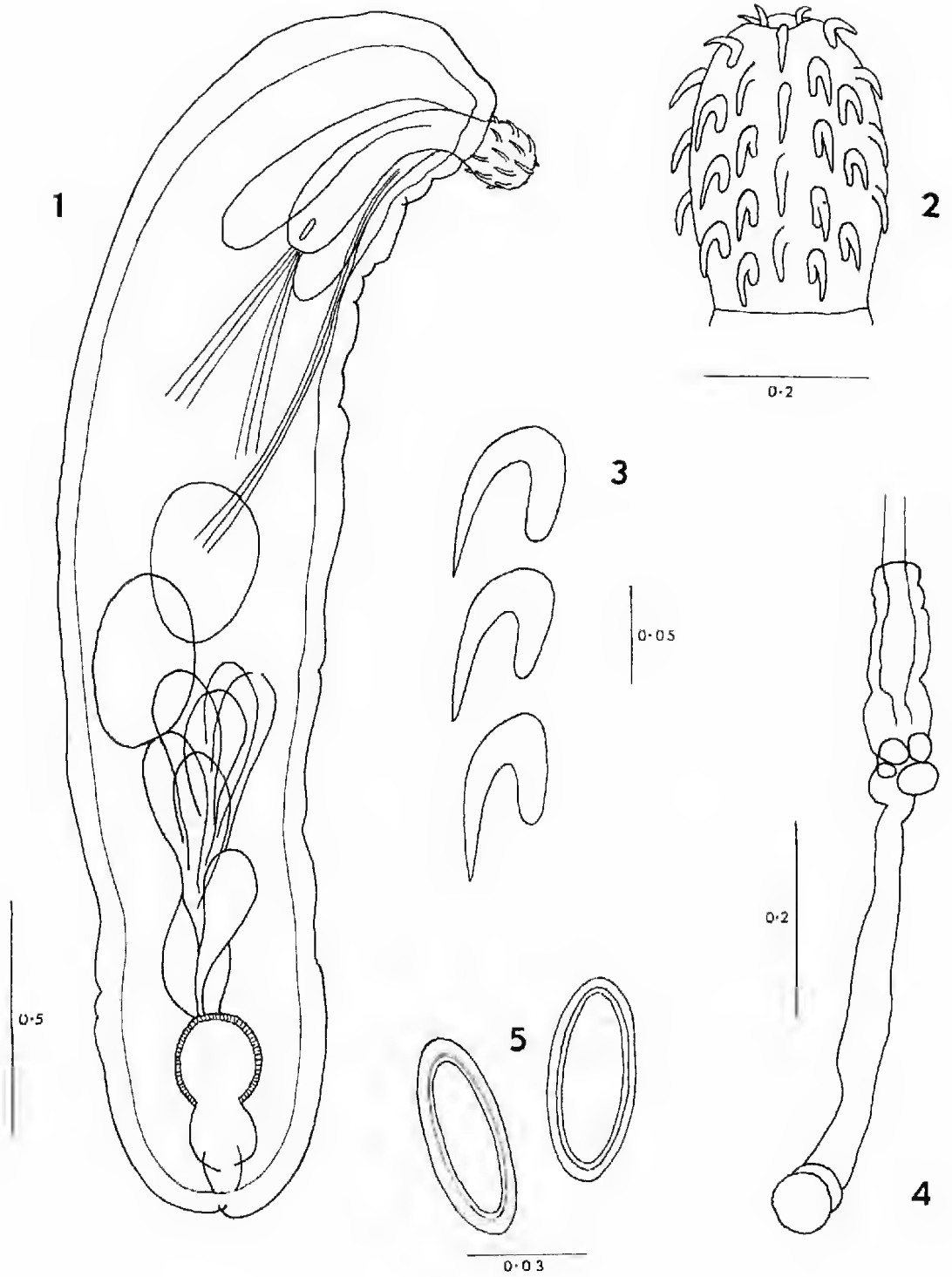
Neoechinorhynchus aldrichettae n. sp.

FIGS. 6-9

Neoechinorhynchus Hamann, 1892; Golvan, 1959: 20.

Host and locality. About 70 live specimens were collected from the posterior gut of three specimens of the local mullet *Aldrichetta forsteri* (Cuv. and Val.) at Port Pirie, South Australia. The finding of acanthocephalans embedded in a mucous region of the posterior gut about 25 mm broad and about 35 mm anterior to the anal aperture is, as far as I know, unusual. The parasites were found in a similar position in the gut of each of the three fish and there is no

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Figs. 1-5. *Pseudoacanthocephalus perthensis*. Fig. 1.—Male. Fig. 2.—Introvert. Fig. 3.—Introvert hooks. Fig. 4.—Female complex. Fig. 5.—Eggs. Measurements in mm.

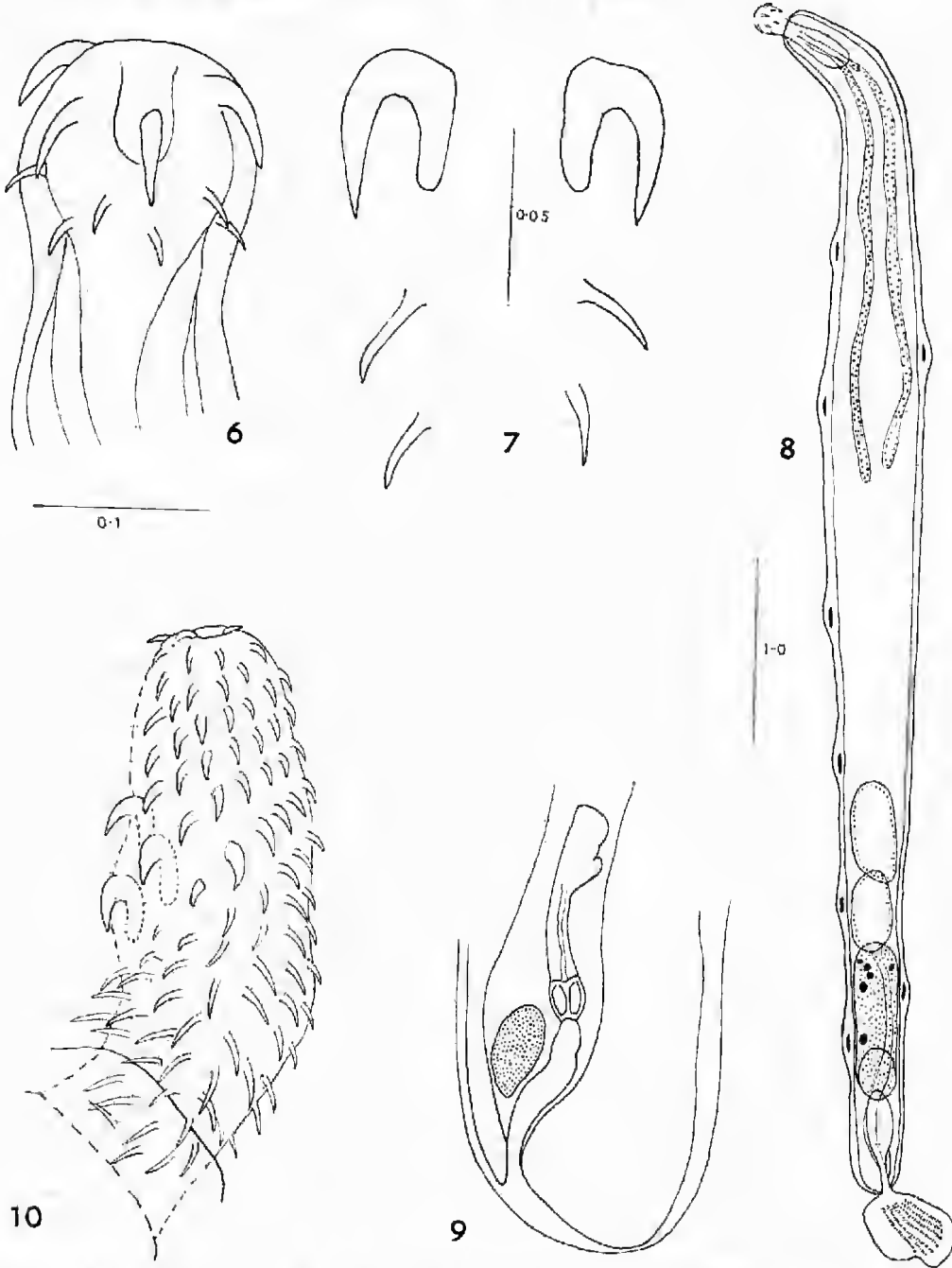
doubt in my mind that they were attached to the gut in this region. The collection contained only seven males.

Type specimens (male and female); Australian Museum, Sydney.

Description. All specimens are less than 8.0 mm long and tapered slightly posteriorly. Anteriorly there is a small, globular introvert sur-

mounted on a short, unarmed, truncated neck. The trunk lacks spines.

The length of the body of the males is 4.1-6.4 mm and the maximum width 0.3-0.6 mm. The corresponding measurements of the female are 4.8-7.8 and 0.5-0.7 mm. The posterior extremity of the female is capable of considerable invagination.



Figs. 6-9. *Neoechinorhynchus aldrichettae*. Fig. 6.—Introvert. Fig. 7.—Introvert hooks. Fig. 8.—Male. Fig. 9.—Female complex. Measurements in mm.
 Fig. 10. *Arhythmorhynchus johnstoni*—introvert.

The maximum length of the globular introvert is 0.09-0.13 mm in the male and 0.10-0.14 in the female. The maximum width is 0.11-0.15 mm in the male and 0.13-0.15 in the female. The width of the neck at its junction with the introvert is 0.09-0.13 and the length 0.05-0.08 mm.

The introvert hooks lie in six spiral rows of three hooks per row. The anterior-most hook of each row is largest and is 49-62 μ m long, measuring in a straight line from the highest point on the hook to the tip of the hook. It bears a strong posteriorly directed rooting process. The length of the second hook is 29-34 μ m and the third 18-25 μ m.

A single-walled receptacle arises just posterior to the point of insertion of the last hook and is about 0.32-0.52 mm long. The cerebral ganglion lies at the base of the receptacle. The lemnisci are about one third as long as the trunk. There are clearly eight large subcuticular nuclei, six on one side and two on the other side of the body wall.

The position of the male reproductive structures varies. In the longest specimen they are placed in the posterior half of the animal but in others they are in the anterior half. The testes are 0.25-0.50 mm long and either overlap slightly or are in tandem. The cement gland is large and 0.5-0.9 mm long and syncytial. The number of nuclei which it contains has not been determined with certainty. There is a cement reservoir and Saefligen's pouch. The male aperture is terminal.

The posterior extremity of many of the females is invaginated. The female structures are comparatively short and about 0.2-0.4 mm long. The vaginal region is often marked by the presence of coagulated material. The eggs are small and measure 25-30 μ m by 11-16 μ m.

Systematic position. The specimens are nearest *N. agilis* Hamann, a species described from Mugilidae of Europe (Meyer, 1932: 172) and Japan (Yamaguti, 1935: 275). The introvert hooks of Hamann's specimens, however, are more than twice the size of the Australian species. This is also true of Yamaguti's specimens.

Southwell and McFie (1925) described a single immature acanthocephalan from Queensland as *N. magnus*. The host is unknown. Although the size of the hooks is comparable with those of *N. aldrichettae* the length of the body is given as 90 mm and the width 1.5 mm, that is the body length of *N. magnus* is more than ten times that of *N. aldrichettae*. The measure-

ment of 90 mm appears to be correct because Southwell and McFie in their text state "the species differs from all other species in being much larger". *N. magnus*, then, appears to be different from the South Australian specimens.

Tripathi (1959) described a number of neo-echinorhynchids from some Indian fish, including *N. bangoni* from *Mugil tade* and *N. elongatus* from *Mugil subviridis*. The lengths of the hooks of *N. bangoni* (0.026-0.038 mm) are considerably smaller than those of *N. aldrichettae* and the well developed rooting process on the third or last hook of each row of *N. bangoni* is not present in *N. aldrichettae*. Tripathi's figure of *N. elongatus* might well serve for *N. aldrichettae*. The two species, however, are different because Tripathi's figure 4 shows that only two subcuticular nuclei are present and because the egg of *N. elongatus* is 0.11 mm long and 0.0266 mm wide.

N. butnerae Golvan, 1956 from *Myletes* is close but is described as possessing 5 + 2 subcuticular nuclei and not 6 + 2. *N. aldrichettae* resembles in many respects *N. octanucleatus* Tubangui, 1933, described, however, from a fresh-water fish.

Arhythmorhynchus limosae n. sp.

FIGS. 11-15

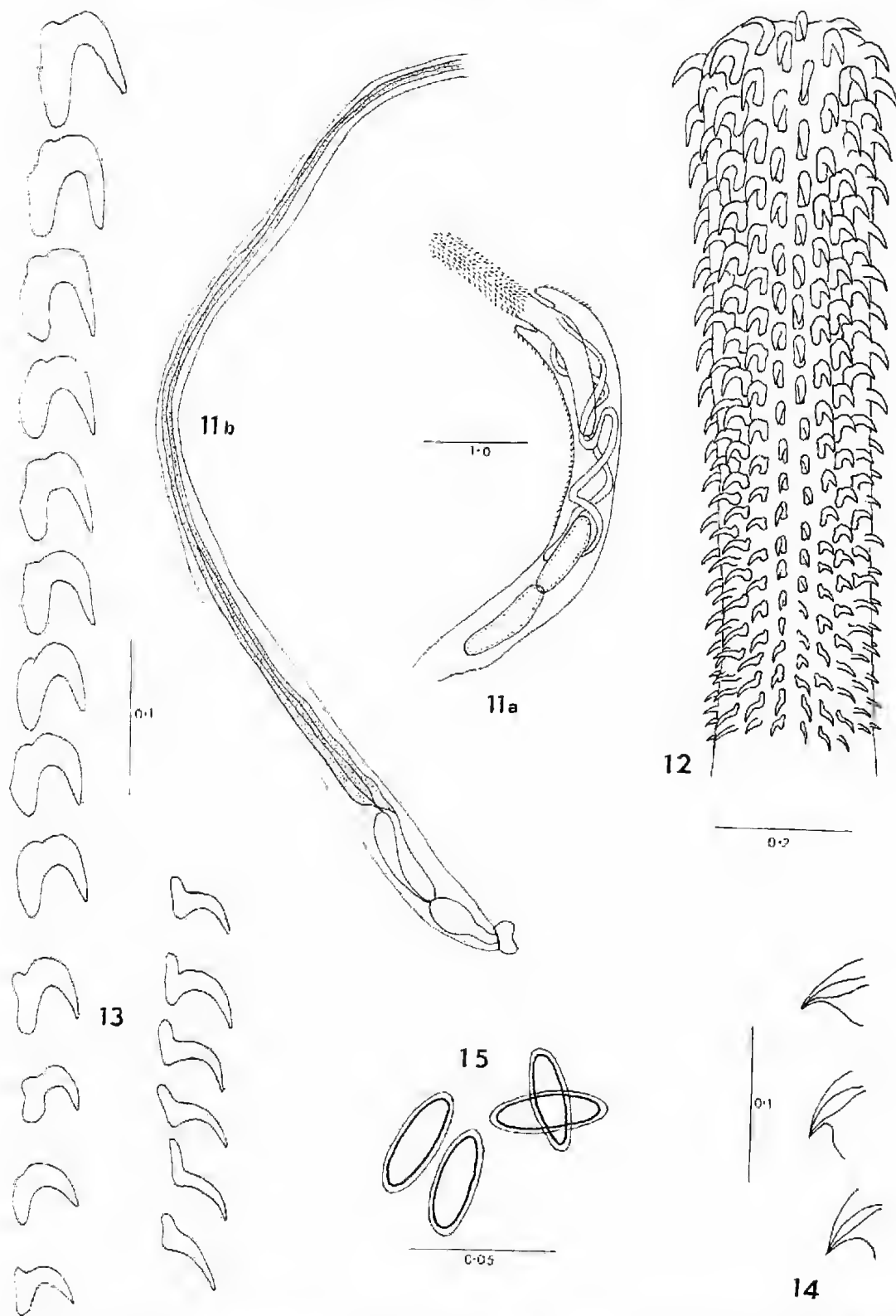
Arhythmorhynchus Lühe; Golvan, 1969: 382.

Host and Locality. Eight specimens collected by Dr. A. J. Bearup (School of Public Health and Tropical Medicine, Sydney) from the gut of the god-wit, *Limosa lapponica*, at Townsville, Queensland on 28/1/59.

Type specimens (male and female); School of Public Health and Tropical Medicine, Sydney.

Description. The specimens are long and slender but swollen slightly anteriorly. The length of the trunk of the males is 14-22 mm and that of the females 21-41 mm. The swollen anterior region of the trunk of the males is 0.5-0.7 mm wide and that of the females 0.5-1.0 mm. The surface of the swollen region is armed with numerous rows of body spines which extend over a greater area of the ventral than the dorsal surface. The rest of the trunk is cylindrical and unarmed and about 0.3-0.5 mm wide in females.

The armed portion of the introvert is 1.1-1.4 mm long and generally cylindrical; its width 0.25-0.3 mm (in some specimens its



Figs. 11-15. *Arhythmorhynchus limosae*. Fig. 11a-b.—Anterior and posterior regions of male. Fig. 12.—Introvert. Fig. 13.—Introvert hooks. Fig. 14.—Body spines. Fig. 15.—Eggs. Measurements in mm.

maximum width is at the anterior extremity). It arises from a short unarmed neck about 0.14-0.2 mm long. In most specimens the neck is retracted into the trunk. In none of the specimens is the introvert swollen near its mid-length, the condition in a number of species of the genus. The introvert is armed with about 19-20 rows of 20-21 hooks per row. The anterior-most hooks are stoutest and possess strong, posteriorly directed rooting processes. The hooks generally decrease in size the further they lie away from the tip of the introvert and their posteriorly directed rooting processes gradually disappear, an anteriorly directed process appearing in its place (Fig. 13). The posterior six 'hooks' of each row are more spiniform and have very well developed anterior rooting processes. The spines are slightly longer than the hooks which immediately precede them. The hooks on the dorsal and ventral surfaces of the introvert appear to be the same size and have the same shape. The introvert sheath is double-walled and its maximum length is 2.1 mm.

The testes lie in a very anterior position of the trunk, usually in the swollen part. They are 0.8-1.0 mm long and 0.20-0.28 mm wide. The cement glands are very long, slender and pressed closely together; they traverse the length of the trunk that lies posterior to the testes. Saeftigen's pouch is 1.0-1.3 mm long and the male aperture is terminal.

The length of the female complex in a specimen about 30 mm long is 4 mm. Ripe eggs are 76-80 μ m long and 26-30 μ m wide and, like those of *A. frassoni*, lack polar prolongations of the middle shell.

Systematic position. This species is different from *A. johnstoni* Golvan (= *A. frassoni* of Johnston and Edmonds, 1951), described from three male specimens that were collected from *Numenius cyanopus* in Queensland. At first sight *A. johnstoni* and *A. limosae* resemble each other closely. A re-examination of the three specimens shows that the two species differ most noticeably in the structure of the introvert hooks. Those of *A. johnstoni* are largest in the centre of the introvert, especially on the ventral side.

A. limosae differs from all other species of the genus in the spination of its introvert.

Arhythmorhynchus johnstoni Golvan.

FIG. 10

A. johnstoni Golvan, 1960; 384 = *A. frassoni* of Johnston & Edmonds, 1951.

Type specimen (male); Australian Museum, Sydney.

Johnston and Edmonds, 1951, described three male acanthocephalans from *Numenius cyanopus* as *A. frassoni* (Molin, 1858). *A. frassoni* has been reported from *Numenius arquatus* and *N. tenuirostris*. Golvan (1960) made the Australian specimens a new species. He gave no reasons for his action. This note is to record that the type material of Golvan's new species has now been lodged in the Australian Museum, Sydney. A figure showing the arrangement of the hooks on the introvert of *A. johnstoni* is included in the present paper. The drawing is made from a mounted specimen which is slightly damaged.

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